



## Low Temperature WWT Bacteria for Winter Operations

**Low Temperature (LT)** is a blend of cold weather Bacillus bacteria designed for reliable performance when water drops below 15°C/60°F. While standard bacteria lose efficiency in cold weather, strains in LT retain up to 90% biological activity at 4°C/39°F, providing effective winter wastewater treatment for plants and lagoons, and supporting pond maintenance where cold weather slows natural biology. By reducing sludge buildup and supporting nutrient balance, LT helps operators avoid seasonal disruptions and ensures a smooth handoff into spring operations.

- **High Cold-Weather Activity:** Maintains ~90% biological performance at 4 °C/39 °F for effective BOD, COD, TSS, and sludge removal.
- **Rapid System Recovery:** Provides reliable low temperature bioaugmentation to speed recovery from winter upsets that normally take 2–3x longer to stabilize
- **Nutrient & Sludge Control:** Limits winter sludge accumulation and nitrogen/phosphorus release that trigger odors, TSS spikes, and algae growth in spring.
- **Hydraulic Resilience:** Protects against washout and fluctuating flows during storms and variable loading.
- **Year-Round Reliability:** Strengthens winter stability while ensuring continuity from cold-weather operations to spring startup.

### INTRODUCTION

Colder temperatures during winter months can result in up to a 50% drop in microbial activity, drastically slowing wastewater treatment. To maintain a high level of microbial activity, it's important to choose a product that will work effectively at low temperatures. Most bacterial activity is significantly slower below 10 °C (50 °F). Bio-Green LT contains multiple bacterial strains that were selected specifically for superior growth in low temperature environments.

### OBJECTIVE

The purpose of this study was to test the effectiveness of Bio-Green LT in low temperature environments.

### EXPERIMENTAL PROCEDURE

A wastewater sample was treated with two competitor products and Bio-Green LT. Wastewater treated with Bio-Green LT was compared to the same wastewater treated with the competitor products. The biological activity was measured over 3 days at 4 °C (39 °F) and 25 °C (77 °F).



### BIO-GREEN LT RESULTS

LT performance stayed consistently high across low and warmer temperatures. **Biological activity at 4 °C (39 °F) was 92% of biological activity at 25 °C (77 °F)** (Figure 1). In comparison, the two competitor products showed only 1% and 5% of biological activity at 4 °C (39 °F) compared to 25 °C (77 °F).

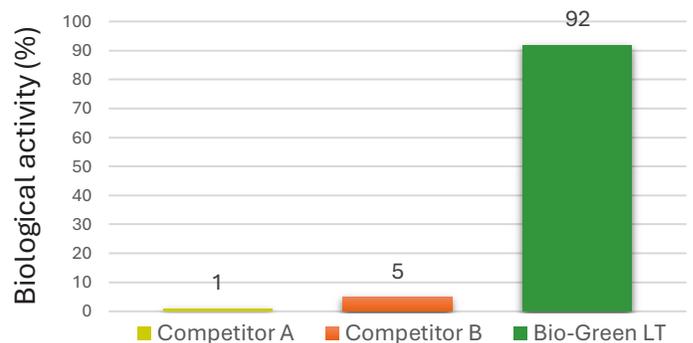


Figure 1. Percentage of biological activity in wastewater treated with Bio-Green LT and competitor products at 4 °C (39 °F) compared to 25 °C (77 °F).



**DAIRY INDUSTRIAL WASTEWATER**

The purpose of this study was to test the effectiveness LT in a dairy wastewater sample at 4 °C (39 °F) and 20 °C (68 °F). The colder temperature severely limited reduction of BOD when the wastewater was left untreated. Bio-Green LT improved BOD reduction at both temperatures and showed efficacy at 4 °C (39 °F) and 20 °C (68 °F) (Figure 2). This allows for effective wastewater treatment throughout the winter and heading into spring.

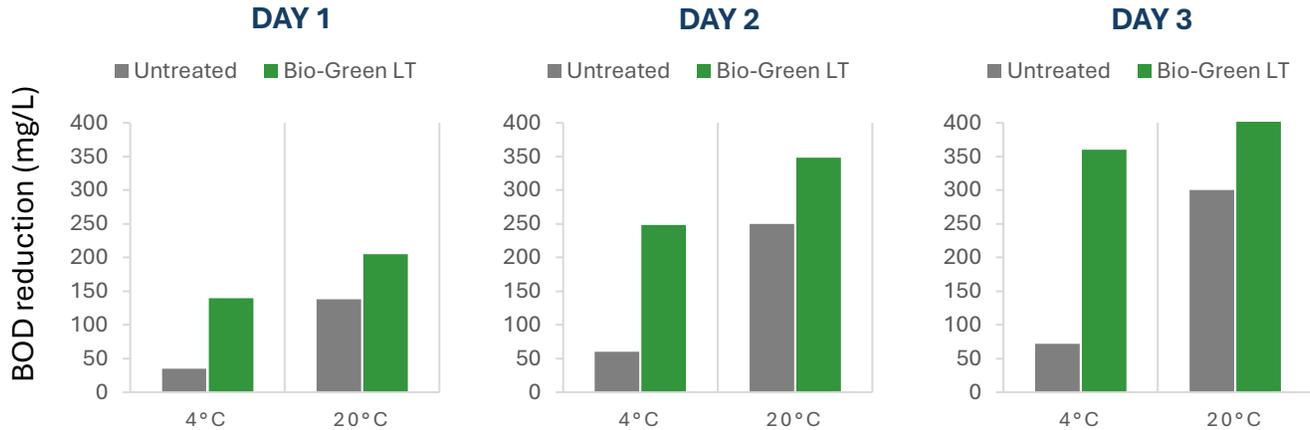


Figure 2. Bio-Green LT BOD reduction at 4 °C (39 °F) and 20 °C (68 °F) over 3 days.

**PULP AND PAPER INDUSTRIAL WASTEWATER**

The purpose of this study was to test the effectiveness of LT in a pulp and paper wastewater sample at 4 °C (39 °F) and 20 °C (68 °F). LT improved BOD reduction at both temperatures and showed efficacy at 4 °C (39 °F) and 20 °C (68 °F) (Figure 3). This allows for effective wastewater treatment to be covered throughout the winter and heading into spring.

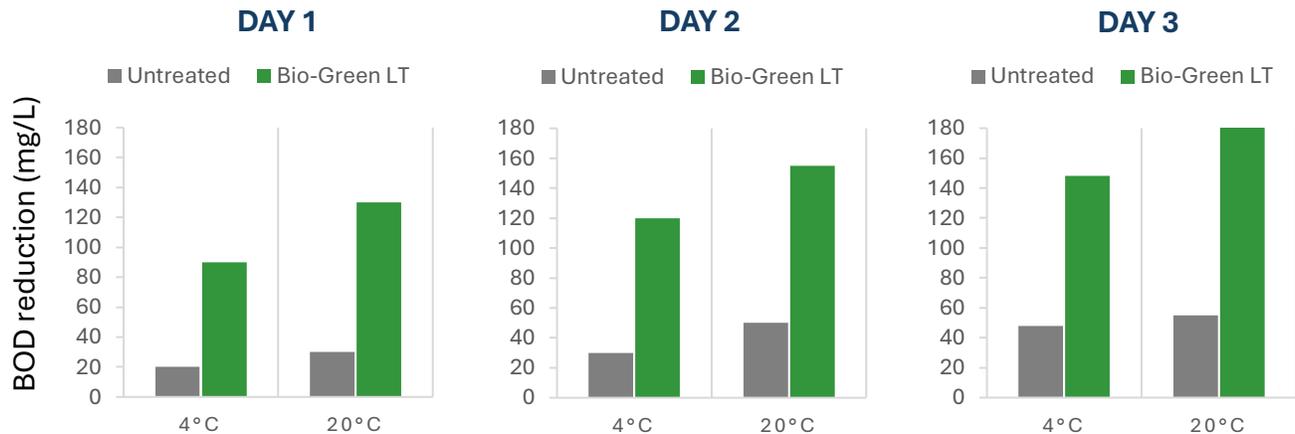


Figure 3. Bio-Green LT BOD reduction at 4 °C (39 °F) and 20 °C (68 °F) over 3 days.